



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:

Tadashi ISHII et al.

Application No.: 10/720,282

Group Art Unit: 2831

Confirmation No.: 4753

Examiner: William H. Mayo III

Filed: November 25, 2003

For: MULTILAYER INSULATED WIRE AND TRANSFORMER USING THE
SAMEDECLARATION UNDER 37 C.F.R. § 1.132Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

I, Atsushi HIGASHIURA, declare and state that:

1. I am a Japanese citizen residing at c/o THE FURUKAWA ELECTRIC CO., LTD. 6-1 Marunouchi 2-chome, Chiyoda-ku, Tokyo, Japan.

I graduated from the Department of Industrial Chemistry, in Faculty of Engineering of Fukui University in 1981 and thereafter joined THE FURUKAWA ELECTRIC CO., LTD. I had been engaged in development of enamel varnish in said company from 1981. Since 1992, I have been engaged in development of materials for three-layered insulated wires at Ecology & Energy Laboratory (renamed from Hiratsuka Laboratory on March of 2000) of said company.

I am one of the joint inventors of the subject matter of the United States Patent Application No.: 10/720,282, filed on November 25, 2003, and am thus intimately familiar with the contents of the application, its prosecution before the United States Patent & Trademark Office, and the references cited therein.

2. I have studied the contents of the cited Higashiura's Japanese Patent Publication No. JP-A-10-125140 and Hosoi's Japanese Patent Publication No.

JP-A-4-345703.

3. To show the superiority of the present invention, the following tests were conducted, by me or under my supervision:

Test

(Example 301)

A multilayer insulated wire was prepared in the same manner as in Example 8, except that PPS-B ($\tan\delta=2.03$) was used in place of PPS-1 as the PPS resin in the third layer. The thus-obtained multilayer insulated wire was referred to as Example 301 according to the present invention.

(Comparative Example 201)

A multilayer insulated wire was prepared in the same manner as in Example 8, except that PPS-A ($\tan\delta=1.99$) was used in place of PPS-1 as the PPS resin in the third layer. The thus-obtained multilayer insulated wire was referred to as Comparative Example 201.

The Example 301 and the Comparative Example 201 were subjected to tests for (A) heat resistance (1), (B) dielectric breakdown voltage, (C) heat resistance (2), and (F) solderability, in the same manner as in EXAMPLES of the specification of the present application. The results are shown in Table B below. In Table B, the results of Examples 8 and 11, as shown on page 36 of the specification, are also described.

Table B

			Example 8	Example 11	Comparative Example 201	Example 301
Conductor			Single wire	Single wire	Single wire	Single wire
Production speed [m/min.]			100	100	100	100
First layer	Resin (A)	PES	100	100	100	100
	Resin (B)	PC	40	40	40	40
	Coating thickness [μm]		35	35	35	35
Second layer	Resin (A)	PES	100	100	100	100
	Resin (B)	PC	40	40	40	40
	Coating thickness [μm]		33	33	33	33
Third layer	PPS-1		100	—	—	—
	PPS-2		—	100	—	—
	PPS-A		—	—	100	—
	PPS-B		—	—	—	100
	Coating thickness [μm]		35	35	35	35
Overall coating thickness			103	103	103	103
Wire appearance			Good	Good	Good	Good
Heat resistance (1)		Class B	Passed	Passed	Passed	Passed
Dielectric breakdown voltage [kV]			25.5	25.6	31.5	23.4
Heat resistance (2) [%]			95	95	46	84
Solderability [sec]			3.0	3.0	3.0	3.0

(Note)

PPS-1: Dic. PPS FZ2200-A5 (trade name, manufactured by Dainippon Ink & Chemicals, Inc.), $\tan\delta = 3.5$ PPS-2: Fortron 0220 A9 (trade name, manufactured by Polyplastics), $\tan\delta = 3.5$ PPS-A: PS-106-1129 (trade name, manufactured by Dainippon Ink & Chemicals, Inc.), $\tan\delta = 1.99$ PPS-B: PS-106-1098 (trade name, manufactured by Dainippon Ink & Chemicals, Inc.), $\tan\delta = 2.03$

As is apparent from the results shown in the above Table B, Comparative Example 201 had only the residual ratio of 46% in the test for heat resistance (2), although it passed the test for heat resistance (1) (Class B) and exhibited high dielectric breakdown voltage. That is, the electric property of the Comparative Example 201 deteriorated greatly after heat treatment at a temperature of 220°C for seven (7) days.

In contrast, Examples 8, 11 and 301 had the residual ratio of 95%, 95%, and 84%, respectively, even if they were subjected to heat treatment at a temperature of 220°C for seven (7) days.

The data already of record in the specification and the supplemental data submitted herewith demonstrate unexpectedly superior results of the claimed multilayer insulated wire and transformer over those of the cited prior art.

4. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: February 9, 2006


Atsushi HIGASHIURA